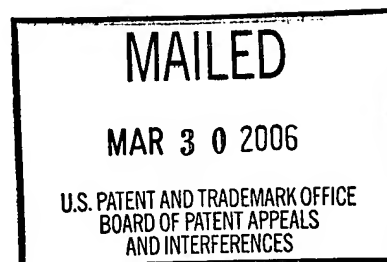


The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte NINA MISHRA,
DANIEL ANTHONY OBLINGER,
and LEONARD PITT



Appeal No. 2006-0514
Application 10/039,617¹

ON BRIEF

Before HAIRSTON, BARRETT, and GROSS, Administrative Patent Judges.

BARRETT, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134(a) from the final rejection of claims 1-10.

We affirm.

¹ Application for patent filed January 4, 2002, entitled "Computer Implemented, Fast, Approximate Clustering Based on Sampling."

BACKGROUND

The invention relates to computer implemented methods for center-based clustering (independent claim 1), for assessing a quality of conjunctive clusters (independent claim 6), and for disjoint conjunction clustering (independent claim 9).

Claim 1 is reproduced below.

1. A computer implemented method for center-based clustering a set, S , of n points to identify k centers through sampling of large data sets, wherein k is an integer value greater than one, the method comprising the steps of:

determining at least one representational value of a diameter of a space M that comprises said set S of said n points;

obtaining a sample R from said set S of said n points;

determining at least one cluster for said sample R ; and

outputting centers, c_1, \dots, c_k , as identified by said cluster of said sample, R .

No references are relied upon in the rejection.

Claims 1-10 stand rejected under 35 U.S.C. § 101 as being directed to nonstatutory subject matter. The examiner finds that the claims are directed to a "mathematical algorithm" that is not limited to a practical application, i.e., it does not produce a "useful, concrete and tangible result." The examiner further states that the claimed invention is not within the "technological arts" because mere recitation of a machine in the preamble does not convert it to statutory subject matter unless there is a positive recitation in the body of the claim to

breathe life and meaning into the preamble and the claims can be implemented by the mind of a person using pencil and paper and so are directed to an abstract idea.

We refer to the final rejection (pages referred to as "FR__") entered March 1, 2005, and the examiner's answer (pages referred to as "EA__") entered August 1, 2005, for a statement of the examiner's rejection, and to the brief (pages referred to as "Br__") received June 29, 2005, for a statement of appellants' arguments thereagainst.

DISCUSSION

Initially, it is noted that the Board has concluded that "technological arts" is not a distinct and separate test for statutory subject matter. See Ex parte Lundgren, 76 USPQ2d 1385 (Bd. Pat. App. & Int. 2005) (precedential), and especially the concurrence/dissent of Administrative Patent Judge Barrett, id. at 1417-26 under headings "Claims that read on statutory and nonstatutory subject matter are unpatentable," "Conclusion," and "'Technological arts' test," for the history of the test. This opinion incorporates-by-reference the analysis by APJ Barrett, id. at 1393-1430.

The fact that "technological arts" is not considered a distinct test does not mean that the U.S. Patent and Trademark Office (USPTO) has eliminated a requirement for "technology." "Technological arts" is a modern term for the "useful arts" of

the Constitution, which has been implemented by Congress in the statutory classes of 35 U.S.C. § 101, id. at 1396-97. The Supreme Court has recognized exclusions for "laws of nature, natural phenomena, and abstract ideas," id. at 1402-05. The test for statutory subject matter should be the definitions of the classes of § 101, the case law on exclusions, and, to the extent it applies, by the test in State St. Bank & Trust Co. v. Signature Fin. Group, Inc., 149 F.3d 1368, 47 USPQ2d 1596 (Fed. Cir. 1998) rather than by the undefined test "technological arts." "The 'technology' requirement implied by 'technological arts' is contained within the definitions of the statutory classes." Lundgren, 76 USPQ2d at 1430. What is meant by "technology" may be best captured by the term "engineering," which is defined as "the application of science and mathematics by which the properties of matter and the sources of energy in nature are made useful to man in structures, machines, products, systems, and processes," because this definition covers the statutory classes of § 101 and indicates that what is being transformed is "matter and the sources of energy in nature." Id. at 1394. A "machine, manufacture, or [man-made] composition of matter" under § 101 represent "things" made by man, which can be patented, and clearly involve technology. Compositions of matter which occur naturally represent laws of nature or natural phenomena, which cannot be patented, id. at 1403 (the distinction

is between products of nature and man-made inventions). Not every "process" in the dictionary sense is a "process" under § 101. The Supreme Court has defined a "process" as involving a transformation of subject matter to a different state or thing, id. at 1398-1401, where the transformation of physical subject matter involves technology.

The claims are directed to a "computer implemented method ... comprising the steps of" The examiner states (FR3):

As to the technological arts recited in the preamble, mere recitation in the preamble (i.e., intended or field of use) or mere implication of employing a machine or article of manufacture to perform some of the recited steps does not confer statutory subject matter to an otherwise abstract idea unless there is a positive recitation in the claim as a whole to breath life and meaning into the preamble.

Apparently the examiner interprets "computer implemented" in the preamble to be in the "technological arts," but concludes that it should not be given any weight because it is not referred to in the body of the claims. We disagree with the examiner that, as a matter of claim interpretation, "computer implemented" is not entitled to patentable weight, and interpret the phrase to clearly require all the steps in the body of the claim to be performed by the computer. It would be awkward and redundant to qualify every step in the body of the claim as being performed by a computer in order to breathe life into the preamble.

The examiner's "technological arts" rejection illustrates some of the problems with that test, as it is applied. First,

the absence of a computer does not necessarily mean that a method is directed to nonstatutory subject matter or, in the examiner's test, subject matter not in the "technological arts." A "process" under § 101 is a series of steps that transforms physical subject matter (tangible or intangible) to a different state or thing, id. at 1398-99, and is not limited to the means disclosed for performing it, id. at 1400-01, and is not required to be performed by a machine. For example, a step of "mixing" two chemicals to produce a composition of matter recites a transformation of physical matter to a different state regardless of whether it is performed by a machine or a human. Second, the presence of a computer does not necessarily define statutory subject matter or, in the examiner's test, subject matter within the "technological arts." Numerous cases have held computer-implemented processes to be nonstatutory, see id. at 1407-08, and it does not appear that State Street changes this law.

The concurrence/dissent of APJ Barrett in Lundgren concludes that there are three viable tests for statutory subject matter: (1) to constitute a "process" under 35 U.S.C. § 101 requires that the method steps transform physical subject matter (tangible or intangible) to a different state or thing; (2) "laws of nature, natural phenomena, and abstract ideas" are exceptions to § 101 and apply to subject matter that would otherwise be within § 101; and (3) the claimed subject matter must be "reduced to some type

of practical application, i.e., 'a useful, concrete and tangible result,'" State Street, 149 F.3d at 1373, 47 USPQ2d at 1600-01. The State Street test so far is limited to machine claims and machine-implemented process claims. See Lundgren, 76 USPQ2d at 1411-16. The instant method claims are all computer implemented and the State Street test should apply. The examiner mentions the "practical application, i.e., 'a useful, concrete and tangible result'" test, but does not perform the analysis in the statement of the rejection (FR3; EA5). Nevertheless, since the response section of the examiner's final rejection addresses appellants' arguments regarding the State Street test, we consider the State Street test to have been raised and argued.

The U.S. Patent and Trademark Office (USPTO) has issued Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility (Guidelines), 1300 Off. Gaz. Patent and Trademark Office 142 (Nov. 22, 2005). The Guidelines are intended to instruct examiners on how to apply the law to the facts. The Board is not bound by guidelines, but applies the law directly to the facts. As stated in the Guidelines: "Rejections will be based upon the substantive law and it is these rejections which are appealable. Consequently, any failure by USPTO personnel to follow the Guidelines is neither appealable nor petitionable." Id. at 142, under "Introduction." Rather than raise a possible question of a new ground of rejection by

applying the transformation test or the abstract idea exception, we rely on the State Street test argued in this case.

The State Street test requires that the claimed subject matter is "reduced to some type of practical application, i.e., 'a useful, concrete and tangible result.'" The "useful, concrete and tangible result" must be specified in the claims; i.e., it is not sufficient that a claim reads on a practical application disclosed in the specification. A claim which reads on both statutory and nonstatutory subject matter should be considered unpatentable. See Lundgren, 76 USPQ2d at 1417-24. Also, the test requires that the "result" must be "useful" and "concrete" and "tangible." And, the test is for a "useful, concrete and tangible result" and, therefore, it is the final result that must be examined, not just the individual steps.

State Street did not define the terms "useful, concrete and tangible." We presume "useful" refers to the utility requirement of § 101, although utility is generally considered a separate requirement from the eligible subject matter ("process, machine, manufacture, or composition of matter") requirement. See Robert L. Harmon, Patents and the Federal Circuit 40 (4th ed. Bureau of National Affairs, Inc. 1998) ("It may be useful to think of eligibility as a precondition for patentability, and of utility as one of the three fundamental conditions for patentability, together with novelty ... and nonobviousness"); Lundgren,

76 USPQ2d at 1395-96. "Concrete and tangible" logically seem to be the opposite of an "abstract idea" and, thus, the concept of an "abstract idea" fits into the State Street test. Things that are well known to represent abstract ideas, e.g., mathematical algorithms, are clearly not "concrete and tangible." The Federal Circuit specifically held in State Street that transformation of data representing some real world quantity (discrete dollar amounts) by a machine was a practical application of a mathematical algorithm, formula, or calculation that produced "a useful, concrete and tangible result," and that a method of applying a PIC indicator "value through switching and recording mechanisms to create a signal useful for billing purposes," AT&T, 172 F.3d at 1358, 50 USPQ2d at 1452, a machine-implemented process, was "a useful, concrete, tangible result." See Lundgren, 76 USPQ2d at 1411-16. This implies that transformation of data by a machine or a machine-implemented process where the data has no correspondence to something in the real world would not produce a "useful, concrete and tangible result." An "abstract idea" (e.g., a mathematical algorithm) cannot be converted into a statutory "process" under § 101 by claiming it is performed on a machine. Id. at 1407-08 (citing cases involving mathematical algorithms performed on machines).

Appellants argue that all of the claims recite at least one step or act that produces something that is useful, concrete, and

tangible (Br7). Appellants argue that claim 1 recites "outputting centers, c_1, \dots, c_k , as identified by said cluster of said sample, R " and, thus, recites a useful, concrete, and tangible result as an output of centers (Br7). The centers are stated to be a "real world" value which is more than a mere idea or concept and proves that claim 1 does not consist solely of the manipulation of an abstract idea (Br7).

The data being operated on in claim 1 are a set S of n points, where the claim does not recite any correspondence between the points and something in the real world. The points could represent any of the kinds of data mentioned in the specification, such as sources on the Web, click streams, phone records, or transactional data (spec. at 2, line 18): if these applications were claimed, the fact situation would be different. "Outputting centers" of clusters is not a useful, concrete, or tangible result because the centers merely represent centers of clusters of abstract data points. The "outputting" can simply be the end result of a calculation and is not necessarily an "output" from the computer. Any abstract idea must have some "output" in the sense of something intended to be accomplished, e.g., a mathematical algorithm has a computed result as an output and a method of better government has an improved government, but this does not make it statutory subject matter. The State Street test does not require the computed end result to control some

external system or process, see Lundgren, 76 USPQ2d at 1411 ("no physical transformation or control took place outside the machine, i.e., the 'useful result' was expressed as a number in a machine"), although post-computer process performance of physical acts outside of the computer falls within the so-called "safe harbors" of the Examination Guidelines for Computer-Related Inventions, 1184 O.G. 87, 91 (March 26, 1996). Therefore, we do not require the claims to perform any physical transformation outside of the computer to comply with § 101. Because the data does not correspond to any real world system or process, we conclude that claim 1 fails to recite a "useful, concrete and tangible result" and is not patentable subject matter. Claim 1 represents the machine performance of an "abstract idea." The rejection of claims 1-5 is affirmed.

Appellants argue that claim 6 recites that it "optimizes conjunctive clusters" and, thus, recites a useful, concrete, and tangible result as optimizing conjunctive clusters to assess the quality of the conjunctive clusters (Br8). The optimization of conjunctive clusters is said to be a "real world" value which is more than a mere idea or concept and proves that claim 6 does not consist solely of the manipulation of an abstract idea (Br8).

The result of claim 6, "optimizes conjunctive clusters," but there is no correspondence between the data and anything in the real world. The data that is transformed to form optimized

conjunctive clusters can be any kind data and the operations performed to do the transformation are abstract mathematical calculations, not steps on real world physical subject matter. Therefore, claim 6 fails to recite a "useful, concrete and tangible result." Claim 6 represents the machine performance of an "abstract idea." The rejection of claims 6-8 is affirmed.

Appellants argue that claim 9 recites "outputting ... disjoint conjunctions ... that exhibits [sic] a highest absolute value of said numeric quality representation" and, thus, recites a useful, concrete, and tangible result as an output of disjoint conjunctions (Br8). The output of disjoint conjunctions is said to be a "real world" value which is more than a mere idea or concept and proves that claim 9 does not consist solely of the manipulation of an abstract idea (Br8).

As discussed in connection with claim 1, the data points being operated on do not correspond to any real world value because they could represent anything and the outputting of results of a calculation on abstract data points does not produce a "useful, concrete and tangible result." The transformation steps of claim 9 are calculations on abstract data quantities and the step of "outputting . . . disjoint conjunctions . . . that exhibits [sic] a highest absolute value of said numeric quality representation" does not provide any correspondence to any real world event or thing and, thus, fails to recite a "useful,

concrete and tangible result." Claim 9 represents the machine performance of an "abstract idea." The rejection of claims 9 and 10 is affirmed.

Appellants' general arguments have been considered but are not found to be persuasive. Appellants first argue that the specification discusses numerous examples of practical applications for the claimed invention, such as to data mining and computer implemented clustering techniques (Br10).

If the claims were limited to specific practical applications the result would be different since the threshold for statutory subject matter appears to be low. Nevertheless, it is not sufficient that practical applications are disclosed: the claims must recite the "useful, concrete and tangible result." It is not sufficient that claims cover both the abstract idea and practical applications of the abstract idea, and that a claim would be infringed if the method was performed on real world data. A claim which covers both statutory and nonstatutory subject matter should be unpatentable, see Lundgren, 76 USPQ2d at 1417-24, although this issue has never been decided.

Appellants argue that one rationale for holding laws of nature, such as mathematical formula, unpatentable is the concern over "preemption" (Br10-11). "Applicants contend that these concerns are not warranted with the claims of the present invention. In other words, the claims do not seek an exclusive

right to a law of nature (i.e., a mathematical equation) or abstract idea. Instead, each independent claim recites elements that do not form a mathematical equation, and each independent claim produces a useful, concrete, tangible result with a practical application." (Br11.)

The concept of "preemption" is not limited to mathematical algorithms. Although we consider appellants' claims to be directed to mathematical algorithms, the presence of a mathematical algorithm is no longer part of the test under § 101. The claims are directed to center-based clustering (claim 1), assessing a quality of conjunctive clusters (claim 6), and disjoint conjunction clustering (claim 9), in the abstract, i.e., they are not limited to any specific kinds of data. The steps cover any and every possible way of performing the steps on a computer. For example, the step of "determining at least one representational value of a diameter of a space M that comprises said set S of said n points" in claim 1 covers every possible way of performing the step in a computer, and the same can be said for the steps of "obtaining a sample R from said set S of said n points" and "determining at least one cluster for said sample R ." That the steps are limited to being performed on a computer does not mean that there is no preemption. See Gottschalk v. Benson, 409 U.S. 63, 71-72, 175 USPQ 673, 676 (1972) ("The mathematical formula involved here has no substantial practical application

Appeal No. 2006-0514
Application 10/039,617

except in connection with a digital computer, which means that if the judgment below is affirmed, the patent would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm itself).

CONCLUSION

The rejection of claims 1-10 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1). See 37 CFR § 1.136(a)(1)(iv) (2004).

AFFIRMED


KENNETH W. HAIRSTON
Administrative Patent Judge


LEE E. BARRETT
Administrative Patent Judge

Anita Pellman Gross
ANITA PELLMAN GROSS
Administrative Patent Judge

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Appeal No. 2006-0514
Application 10/039,617

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